



JAW

Attorney Docket No. 300.1153

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:

Michio HORIUCHI, et al.

Application No.: 10/816,879

Group Art Unit: 1746

Filed: April 5, 2004

Examiner: Unassigned

For: FUEL CELL DEVICE

**INFORMATION DISCLOSURE STATEMENT**

Commissioner for Patents  
PO Box 1450  
Alexandria, VA 22313-1450

Sir:

In accordance with the duty of disclosure provisions of 37 CFR § 1.56, there is hereby provided certain information which the Examiner may consider material to the examination of the subject U.S. patent application. It is requested that the Examiner make this information of record if it is deemed material to the examination of the subject application.

1. Enclosures accompanying this Information Disclosure Statement are:

- 1a. ☒ Form PTO-1449.
- 1b. ☐ Copy(ies) of IDS citation(s), except for U.S. Patents and U.S. Patent Application publications.
- 1c. ☐ English language copy of a communication(s) from a foreign Patent Office or a PCT International Search Report.
- 1d. ☐ English language translation (complete, Abstract or relevant portion(s)) attached to non-English language publications as indicated on the attached Form PTO-1449.
- 1e. ☒ Explanations of Relevancy of References (ATTACHMENT 1(e), hereto)
- 1f. ☐ List of Copending Applications (ATTACHMENT 1(f), hereto).
- 1g. ☐ List of Additional Submitted Documents (ATTACHMENT 1(g), hereto).

2. ☒ This Information Disclosure Statement is filed under 37 CFR § 1.97(b):

(Check either Item 2a or 2b or 2c or 2d)

- 2a. ☐ Within three months of the filing date of a national application;
- 2b. ☐ Within three months of the date of entry of the national stage as set forth in § 1.491 in an international application.
- 2c. ☒ Before the mailing of a first Office Action on the merits; or
- 2d. ☐ Before the mailing of a first Office Action after the filing of a Request for Continued Examination under § 1.114.

3. ☐ This Information Disclosure Statement is filed under 37 CFR § 1.97(c) after the period specified in paragraph 2 above but before the mailing date of any of a Final Office Action under § 1.113, a Notice of Allowance under § 1.311 or an action that otherwise closes prosecution in the application, AND

*(Check either Item 3a or 3b; Item 3b to be checked if any reference known for more than 3 months)*

- 3a. ☐ The § 1.97(e) Statement in Item 5 below is applicable; OR  
 3b. ☐ The \$180.00 fee set forth in 37 CFR § 1.17(p) is:  
☐ enclosed.  
☐ to be charged to Deposit Account No. 19-3935.

4. ☐ This Information Disclosure Statement is filed under 37 CFR § 1.97(d) after the period specified in paragraph 3 above, but on or before payment of the Issue Fee, AND

- 4a. ☐ The § 1.97(e) Statement in Item 5 below is applicable; AND  
 4b. ☐ The \$180.00 fee set forth in 37 CFR § 1.17(p) is:  
☐ enclosed.  
☐ to be charged to Deposit Account No. 19-3935.

5. ☐ Statement under § 1.97(e) *(applicable if Item 3a or Item 4a is checked)*

*(Check either Item 5a or 5b)*

- 5a. ☐ In accordance with 37 CFR § 1.97(e)(1), it is stated that each item of information contained in this Information Disclosure Statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this Information Disclosure Statement.  
 5b. ☐ In accordance with 37 CFR § 1.97(e)(2), it is stated that no item of information contained in this Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart foreign application and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in this Information Disclosure Statement was known by any individual designated in § 1.56(c) more than three months prior to the filing of this Information Disclosure Statement.

6. ☐ This is a continuation/divisional/continuation-in-part application under 37 CFR § 1.53(b).

*(Check appropriate Items 6a and/or 6b)*

- 6a. ☐ Copies of the publications listed on the attached Form PTO-1449 which were previously cited in prior application Serial No. \_\_, filed on \_\_, and which is relied on for an earlier effective filing date for the subject application under 35 U.S.C. § 120, have been omitted pursuant to 37 CFR § 1.98(d).  
 6b. ☐ Copies of the publications listed on the attached Form PTO-1449 which were not previously cited in prior application Serial No. \_\_, filed on \_\_, and which is relied on for an earlier effective filing date for the subject application under 35 U.S.C. § 120, are provided herewith.

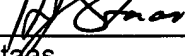
7. ☐ This is a Request for Continued Examination under 37 CFR § 1.114.  
(Check either Item 7a or 7b)
- 7a. ☐ The Issue Fee has not been paid.
- 7b. ☐ A Petition to Withdraw from issue under 37 CFR § 1.313(c) is filed concurrently herewith or has been granted. A Request for Continued Examination under 37 CFR § 1.114, after payment of the Issue Fee, is proper in accordance with 37 CFR § 1.114(a), respectively.
8. ☐ This is a Supplemental Information Disclosure Statement.  
(Check either Item 8a or 8b)
- 8a. ☐ This Supplemental Information Disclosure Statement under 37 CFR § 1.97(f) supplements the Information Disclosure Statement filed on \_\_\_\_\_. A bona fide attempt was made to comply with 37 CFR § 1.98, but inadvertent omissions were made. These omissions have been corrected herein. Accordingly, additional time is requested so that this Supplemental IDS can be considered as if properly filed on \_\_\_\_\_.
- 8b. ☐ This Supplemental Information Disclosure Statement is timely filed within one (1) month of the Notice under 37 CFR §§ 1.97 and 1.98, mailed \_\_\_\_\_.
9. ☐ In accordance with 37 CFR § 1.98, a concise explanation of what is presently understood to be the relevance of each non-English language publication is:  
(Check appropriate Items 9a, 9b, 9c and/or 9d)
- 9a. ☐ satisfied for the non-English language publication(s) cited on the enclosed "English language version of the search report or action which indicates the degree of relevance found by the foreign office". (See MPEP § 609, Minimum Requirements for an Information Disclosure Statement, Part A(3): Concise Explanation of Relevance, 8th Ed., Rev. 2)
- 9b. ☐ set forth in the application.
- 9c. ☐ satisfied for the non-English language publication(s) indicated on the attached Form PTO-1449 as having an English language translation (complete or relevant portion(s)) attached thereto.
- 9d. ☐ enclosed as Attachment 1(e), hereto.
10. No admission is made that the information cited in this Statement is, or is considered to be, material to patentability nor a representation that a search has been made (other than search report(s) from a counterpart foreign application or a PCT International Search Report, if submitted herewith). 37 CFR §§ 1.97(g) and (h).

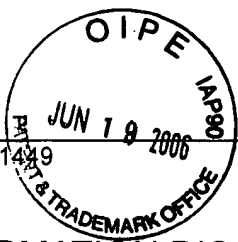
11. The Commissioner is authorized to credit any overpayment or charge any additional fee required under 37 CFR § 1.17 for this Information Disclosure Statement to Deposit Account No. 19-3935.

Respectfully submitted,

STAAS & HALSEY LLP

Dated: June 16, 2008  
1201 New York Ave., N.W., 7th Floor  
Washington, D.C. 20005  
Telephone: (202) 434-1500  
Facsimile: (202) 434-1501

By:   
H. J. Staas  
Registration No. 22,010



FORM PTO-1449

U.S. DEPARTMENT OF COMMERCE  
PATENT AND TRADEMARK OFFICE

Sheet 1 of 1

ATTORNEY DOCKET NO.

APPLICATION NO.

300.1153

10/816,879

FIRST NAMED INVENTOR

Michio HORIUCHI, et al.

FILING DATE

GROUP ART UNIT

April 5, 2004

1746

## INFORMATION DISCLOSURE STATEMENT

(Use several sheets if necessary)

### U.S. PATENT DOCUMENTS

*EXAMINER INITIAL		DOCUMENT NO.	DATE	NAME	CLASS	SUB- CLASS	FILING DATE
	AA	2004/0237529	12/02/04	da Silva			
	AB	6,766,817	07/27/04	da Silva			
	AC						
	AD						
	AE						
	AF						

### FOREIGN PATENT DOCUMENTS

		DOCUMENT NO.	DATE	COUNTRY	TRANSLATION YES NO		ABSTRACT
	AG						
	AH						
	AI						
	AJ						
	AK						
	AL						

OTHER REFERENCES (Including Author, Title, Date, Pertinent Pages, Etc.)

TRANSLATION  
YES NO

	AM			
--	----	--	--	--

EXAMINER

DATE CONSIDERED

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

**ATTACHMENT 1(e)**

ATTORNEY DOCKET NO.	APPLICATION NO.
300.1153	10/816,879
FIRST NAMED INVENTOR	
Michio HORIUCHI, et al.	
FILING DATE	GROUP ART UNIT
April 5, 2004	1746

**EXPLANATIONS OF RELEVANCY  
OF REFERENCES**

Listed below is an unsolicited e-mail received by the undersigned attorney of counsel for Applicants herein, from Elson Silva, Ph.D. of Tubarc Technologies, LLC, asserting relevancy of Dr. Silva's patent documents, U.S. Patent Publication No. 2004/0237529 (Reference AA) and U.S. Patent No. 6,766,817 (Reference AB), the content of which is reproduced in the following:

-----Original Message-----

**From:** Elson [mailto:el\_silva@uol.com.br]

**Sent:** Sunday, May 14, 2006 3:39 PM

**To:** Info

**Cc:** licensing@tubarc.com; 'Elson'

**Subject:** US 20040202910 - Requesting IDS of US 6,766,817 for patenteability

**Importance:** High

**Darleen J. Stockley**

Washington, District of Columbia

Associate

phone 202.434.1500

fax 202.434.1501

Dear Ms. Stockley,

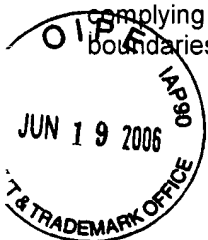
I am afraid to inform you that the IP rights that your client is trying to claim may have already been provided to another party. It is clearly logical to believe that your client gets no advantage receiving IP rights overlapping granted ones.

Serving this IDS to you is on the common interest to your client, to your reliable and honorable professional assistance, and to **Tubarc Technologies** business preventing overlapping boundaries of IP hurting an emerging technology that can provide benefits to many industries including also your client. You can read the Law in the end of this message if you are not used to disclosure compliances.

Indeed Your Law Firm can benefit itself by learning more about the issue to serve accordingly the IP community that wants to expand boundaries of knowledge and acquire new niches with a strong hand on THEORY OF SCIENCE bearing the fundamentals of the rules.

**Unsaturated Hydraulic Flow** is a very high and correct technical expression in the science of fluids moving on porosities like Hydrogeology and Soil Physics which has being ignored and is mentioned only in two granted patents by the USPTO (US 6,766,817) and in 31 patents as Unsaturated Flow, while wick or wicking 21,116 patents. Wick and capillary expressions come heavily from scientific communities away from Geosciences and deprived on their best analytical tools and insights to address this special functioning of nature deeply affecting Hydrodynamics and by molecular connectivity in the mass flow also overall **DYNAMICS (20040237529)**.

Patent US 6,766,817 is an invention ("scientific discovery") with extensive effect on general HYDROLOGY APPLICATIONS (Unsaturated Hydraulic Flow) revealing new conceptions of fluid moving on porous systems not discussed yet by regular Technical-Scientific literature due to the novelty. Consequently your firm can expect many IDSs complying with the Law in case you are filing patents with fluidic applications if they bear uncertain conceptional boundaries related to the hydrology of fluids moving on porous systems.



**US 6,766,817 'Fluid conduction utilizing a reversible unsaturated siphon with Tubarc porosity action'** Jul 27, 2004 by Elson Silva assigned to Tubarc Technologies, LLC.

Under the IDS 37 CFR § 1.56 (d) I request you to refer "**Silva, 2004 US 6,766,817**" to the USPTO so that it can be used as reference in the examining process of the following Patent Application below:

**US 20040202910 'Fuel cell device'** October 14, 2004 by **Horiuchi, Michio**; (*Nagano-shi, JP*) ; **Suganuma, Shigeaki**; (*Nagano-shi, JP*) ; **Watanabe, Misa**; (*Nagano-shi, JP*) assigned to **SHINKO ELECTRIC INDUSTRIES CO., LTD**

Just a few Law firms are blocking my emails. Their subtle message to Tubarc Technologies and to USPTO is that they want their clients have their patents approved even if awarded with IP that belong to others. Also, some similar huge applicants are hiding their reaching to prevent general public a fast access to contest their IP requests. Any IDS serving by its own nature has a conception of being already an 'unsolicited' delivery operation whatever the way it is consumed. Electronic systems are advanced tools to help shaping new procedures on IP affairs and perhaps soon valid emails from applicants may be printed in the patents. IP should not be a hide and seek process, unless when applicants intend to get what they are not entitled to have.

There is an enormous confidence that any Court of the Law will be bound to the principles of Epistemology and Metaphysics of Science. Any acquired right is bound to the words claiming them as well the intrinsic conceptions of expression. Just as an example I believe to be vacant an IP right over a *ball* that is not *spherical*. *Balls* can only be used for *spherical* objects. **Wicks** not working like *wicks* are very likely to be Tubarc exploiting new conceptions in Hydrodynamics having no Etymological link to Thermodynamics.

There is an urgent need to draw precise lines on the scientific boundaries in order to protect IP between **wick**, **capillary**, and **Tubarc** since people filing patents with fluidic devices are not aware of such limits and likely violating acquired IP rights. I provide some insights below according to my understanding (PhD) in Hydrogeology/Soil Physics and new scientific conceptions developed (US 6,766,817).

**Wick** = Thermodynamics + Hydrodynamics (upward flow toward a flame). **Wicks** have to work as **wicks** on oil lamps (Metaphysics of Science).

**Capillary** (and derivatives) = **Tube theory** (is not a porosity because lateral walls of tubes do not let multidirectional flow hurting the functioning of Unsaturated Hydraulic Zone flowing downward).

**Capillary Action** = fluid moving by unsaturated hydraulic flow inside cylindrical structures having a unique directional flow (common knowledge - no porosity)

**Tubarc Action** = fluid moving by unsaturated hydraulic flow on porosity allowing multidirectional flow (IUS Pat. 6,766,817).



**Tubarc = Hydrodynamics of fluid moving on porosity systems** (Enhanced porosity with connected pores for Unsaturated Hydraulic Flow, allowing reversible flow, transfer of fluid between compartments, supply on demand, removal by molecular drainage, total control of fluid matrix potential, and hydrodynamics properties for reliability to fluidic applications exploiting boundaries between saturated and **unsaturated hydraulic zones**). Tubarc has no compliance with **Thermodynamics** since it comes from a pure Hydrogeological background of fluid moving on porous systems (**US Pat. 6,766,817**).

---

**Tubarc** conceptions (**US Pat. 6,766,817**) is also logically encompassing all hydrodynamics of **wicks** that departs from oil lamps (**Thermodynamics**) and **capillary action** that deviates from the cylindrical structures of **capillaries**. **Tubarc** offers new boundaries of knowledge with new conceptions of hydrodynamics recognized as **undefined** by conventional scientific literature to **Unsaturated Hydraulic Flow** very important to foster technological advancement.

**Tubarc Pat. 6,766,817** employed a simple approach common in Metaphysics of Science of defining what it is, and not what it is not. Technically it is impossible to prove that things do not exist by a simple reason of lack of conceptions to describe what is unknown. **Wick** and **capillary action** derivatives that fail on their assumptions are inside the scope of **Tubarc** defined conceptions.

I would like to emphasize that **Tubarc** was filed on **Jul 25, 2001** and became publicly known as **US 2003/0160844 Aug. 28, 2003** being issued on **Jul 27, 2004** as **US 6,766,817**.

As scientist I am glad and encouraged to compel an upgrading system that can deliver to consumers innumerable advantageous products that are less disposable and more efficient like self-watering ornamental plants, self-inking pens, markers, ink cartridges, printers, irrigation on demand, molecular drainage and filtering, more reliable fuel cells, heat pipes, turbines, pumps, and an engine that can burn biomass suggesting an easy solution changing the engine to use a broader resource of fuels. Instead of producing alcohol it is technically feasible to burn the entire plant **20040237529**. **Tubarc** is a set of conceptions borrowing from applied spatial geometry some nature secrets that helps a humane existence.

All the acquired rights will be pursued under the rigor of the Law and its full compliance should benefit all parts involved direct or indirectly. Some additional information regarding **Theory of Science** is provided in the end.

Please, let me know if I can be of any further assistance regarding the subject.

Kind regards,

**Elson Silva, Ph. D.**

Tubarc Technologies, LLC

Av. Dr. Júlio Soares de Arruda, 838

Parque São Quirino

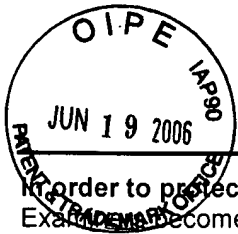
CEP 13088-300 - Campinas - SP - Brazil

Phone 55 \*19 3256-7265

Email: [el\\_silva@uol.com.br](mailto:el_silva@uol.com.br)

Website: [www.tubarc.com](http://www.tubarc.com)





In order to protect acquired rights at US Pat 6,766,817 it is advisable that Inventors, Patent Attorneys, and Patent Examiners become aware of such importance of correctly addressing fluids moving on porosity aiming at best exploiting technological boundaries on general applications. I suggest consulting **Dominico & Schwartz, 1990. Physical and Chemical Hydrogeology. Pg. 88. Wiley.**

US pat. 6,766,817 reveals new conceptions in hydrodynamics for fluid conduction/retention suggesting 'capillary action' be replaced by 'tubarc action' correcting flaws associated to tube theory of fluids moving on random porosity. The appropriate technical expression of fluids moving through porosity is Unsaturated Hydraulic Flow by Hydrological Sciences. Wick etymology is associated to fuel moving toward flames on oil lamps restraining advanced development of general hydrodynamic functioning. An enhanced porosity with connected voids is revealed at US 6,766,817 allowing higher control on hydrodynamic properties like: fluid supply on demand, molecular drainage, molecular filtering, adjustable fluid matrix potential, molecular connectivity on mass flow, adjustable ratio of porosity void displacement for solid:liquid:air, and enhanced unsaturated hydraulic flow with anisotropy for a broad range of fluid application devices (Soil Physics and/or Hydrogeology).

Originally wicks were invented by the Stone Age Man around 70,000 years ago and its functioning is primarily associated to the movement of fluids toward the flame. By simple logical deduction it can be implied that wicks were the most important tools in the ancient human development helping to provide an 'easy' way to preserve fire by keeping a small flame burning small amount of fuel. The Discipline of Hydrogeology (Hydro, Geo) that deals with the movement of fluid in the natural porous systems does not address any wicking in the literature. So, there is a gap in science that everybody can benefit by exploiting deeply Hydrodynamics properties developing higher reliability on hydrological functioning. All wicks are tools that are aimed at transporting fuel towards a flame in a combination of Hydrodynamics and Thermodynamics. Thermodynamics is not a relevant issue in Hydrogeology. Wick functioning has a strong relation to Thermodynamics regarding fuel and fire that needs to be addressed on its claim regarding the spatial dynamic assessment.

#### **There is an urgent need to define precise boundaries of IP between Tubarc, wick, and capillary:**

The subject under US Pat. 6,766,817 is **deeply complex** ('scientific discovery') and I am providing some preliminary explanation to everybody involved in the issue so that clear boundaries between **Tubarc, wick, and capillary** can be drawn.

Technically speaking with a deep Hydrogeological background and a strong understanding on Animal and Plant Physiology it seems that the words wick and capillary becomes highly unpatentable on many cases due to the following logical reasons as consequence of expansion of scientific boundaries:

**Wick** = under assessment of hydrological functioning, but still patentable when the device works on candles and oil lamps. Any claimed wick that can perform like a wick is etymologically safe and allowed for not violating its own assumption by Metaphysics rules of existence.

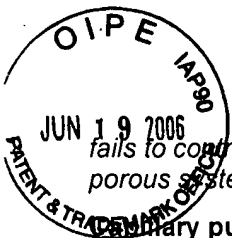
As analogy any IP granted to a **ball** that has a **cubic** format is flawed and has merit for cancellation since a **ball** is know as a **spherical** object.

(Any claimed wick that fails to work as a wick loses its own existential rights since it violates Metaphysics of Science regarding the boundaries of existence of objects. Ex. IP on "football" must be played with ball and using foot, if anybody wants to use their hands instead, then Metaphysics suggest it be changed to "handball").

**Wicking** = is only valid when the Unsaturated Hydraulic Flow is upward because no oil lamp allows flow in other direction since the flame sucking fluid during its functioning keeping a constant fluid matrix gradient toward the flame always on TOP.

**Capillary action** (and derivatives) = flawed for not allowing multidirectional flow associated to the restraining of tube theory (US 6,766,817).

(Capillary action still holds true becoming patentable if the fluid is indeed moving inside cylindrical structures like capillaries which are not a porous system but a tube container just having inlet and outlet in the extremities. A bundle of capillaries



fails to contrive with the hydrodynamics properties of Unsaturated Hydraulic Flow downward and cannot be considered a porous system exploiting the dynamic functioning of hydrological zones.)

**Capillary pumping** = Unsaturated Hydraulic Flow and should not be allowed because there is no pumping as external power but just fluid moving by adhesion-cohesion to a porosity. Water in the soil profile moves by Unsaturated Hydraulic Flow (capillary fringe) and not capillary pumping. Fluids moving on porosity are addressed by Hydrodynamics/Hydrogeology.

(Presently **206 granted patents** employing capillary pumping are violating common knowledge in Geosciences - Hydrogeology and it seems to become highly eligible for cancellation for poorly addressing hydrological functioning if USPTO wants to keep a unique standard connotation impartial system among disciplines and preserve basic rules set by Epistemology and Metaphysics of Science).

An aggravation comes from writing style employed on patents that fuzzy words and disguised explanation of ideas hurts vocabulary precision and straight understanding. This strategy may foster patent approval ensuring success on IP business but also can lead toward losses in the invention defense since it departs from the real meaning that Etymology can provide to the core functioning of brilliant ideas. Technical writing in science always advises about selecting the most simple and direct words to express something going as close as possible to the roots reaching the first meanings that that word was created originally and comply with the power of expressing what it really is under the rules of Existential Metaphysics. General public tolerance of distortions to Etymology like playing "football", but mostly carrying something that is not spherical should not provide reference to science and technology where Nature functioning demands a consistent way of expanding knowledge.

In some extent this present problem is caused by the fact that people working with **fluids** (Chemists, Electronic, Mechanical and Chemical Engineers, Biologists, etc) filing patents are not familiar with content in the disciple of **Hydrogeology** that develops basic common knowledge to assess thoroughly the deep complexity of fluids **moving on porosity**. Also, Soil Scientists and Geologists usually do not develop devices to file patents on general fluid applications to imprint required attention on the matter. Then, we can expect that a huge technological improvement be reached when the situation is cleared since an expanded boundary of knowledge can be attained by employing Tubarc which develops conceptions not even available in **Hydrogeology** when pores can be connected and the **Unsaturated Hydraulic Flow** harnessed leading to reliability of hydrodynamic functioning because many proprieties can be controlled.

Present etymological use of fluids moving on porosity according to USPTO database by patent search hits (May 4, 2006) showing clearly how deep Hydrogeology has been ignored on a huge gap in science and technology associated to Hydrology:

- 2 "Unsaturated Hydraulic Flow" (US pat. 6,766,817 is one of them)
- 31 "Unsaturated Flow"
- 206 "Capillary pumping"
- 17,531 "Capillary (Force OR Action OR Movement)"
- 21,116 "Wick or Wicking"

I would suggest the interested parties consulting with experts in Soil Physics and/or Hydrogeology (PhD) for a deeper comprehension on the issue in order to get appropriate technological assessment dealing with the strict boundaries of Hydrology of Porous Systems.

---

(p 1 line 65 **US pat. 6,766,817**) A fluid that possesses a positive pressure can be generally defined in the field of **hydrology** as **saturated fluid**. Likewise, a fluid that has a negative pressure (i.e., or suction) can be generally defined as an **unsaturated fluid**. Fluid matric potential can be negative or positive. For example, water standing freely at an open lake, can be said to stand under a gravity pull. The top surface of the liquid of such water accounts for zero pressure known as the water table or hydraulic head. Below



the water table, the water matric potential (pressure) is generally positive because the weight of the water increases according to parameters of force per unit of area. **When water rises through a capillary tube or any other porosity**, the water matric potential (e.g., conventionally negative pressure or suction) is negative because the solid phase attracts the water upward relieving part of its gravitational pull to the bearing weight. The suction power comes from the amount of attraction in the solid phase per unit of volume in the porosity.

(p 2 line 60 US pat. 6,766,817) Specialized scientific literature about unsaturated zones also recognizes this shortcoming. For example: **"Several differences and complications must be considered. One complication is that concepts of unsaturated flow are not as fully developed as those for saturated flow, nor are they as easily applied."** (See Dominico & Schwartz, 1990. **Physical and Chemical Hydrogeology. Pg. 88. Wiley**). Concepts of unsaturated flow have not been fully developed to date, because the **"capillary action"** utilized to measure the adhesion-cohesion force of porosity is restrained by capillary tube geometry conceptions. The term **"capillary action"** has been wrongly utilized in the art as a synonym for unsaturated flow, which results in an insinuation that the tube geometry conception captures this phenomenon when in truth it does not.

---

#### § 1.56 Duty to disclose information material to patentability. - PATENT RULES

(a) **A patent by its very nature is affected with a public interest.** The public interest is best served, and the most effective patent examination occurs when, at the time an application is being examined, the Office is aware of and evaluates the **teachings of all information material to patentability**. Each individual associated with the filing and prosecution of a patent application has a duty of **candor and good faith** in dealing with the Office, which includes a duty to disclose to the Office all information known to that individual to be material to patentability as defined in this section. The duty to disclose information exists with respect to each pending claim until the claim is cancelled or withdrawn from consideration, or the application becomes abandoned. Information material to the patentability of a claim that is cancelled or withdrawn from consideration need not be submitted if the information is not material to the patentability of any claim remaining under consideration in the application. There is no duty to submit information which is not material to the patentability of any existing claim. The duty to disclose all information known to be material to patentability is deemed to be satisfied if all information known to be material to patentability of any claim issued in a patent was cited by the Office or submitted to the Office in the manner prescribed by §§ 1.97(b)-(d) and 1.98. However, no patent will be granted on an application in connection with which fraud on the Office was practiced or attempted or the duty of disclosure was violated through bad faith or intentional misconduct. The Office encourages applicants to carefully examine:

- (1) Prior art cited in search reports of a foreign patent office in a counterpart application, and
  - (2) The closest information over which individuals associated with the filing or prosecution of a patent application believe any pending claim patentably defines, to make sure that any material information contained therein is disclosed to the Office.
- (b) Under this section, information is material to patentability when it is not cumulative to information already of record or being made of record in the application, and
- (1) It establishes, by itself or in combination with other information, a *prima facie* case of unpatentability of a claim; or
  - (2) It refutes, or is inconsistent with, a position the applicant takes in:
    - (i) Opposing an argument of unpatentability relied on by the Office, or
    - (ii) Asserting an argument of patentability.

A *prima facie* case of unpatentability is established when the information compels a conclusion that a claim is unpatentable under the preponderance of evidence, burden-of-proof standard, giving each term in the claim its broadest reasonable construction consistent with the specification, and before any consideration is given to evidence **which may be submitted in an attempt to establish a contrary conclusion of patentability.**



(c) Individuals associated with the filing or prosecution of a patent application within the meaning of this section are:

(1) Each inventor named in the application;

(2) Each attorney or agent who prepares or prosecutes the application; and

(3) Every other person who is substantively involved in the preparation or prosecution of the application and who is associated with the inventor, with the assignee or with anyone to whom there is an obligation to assign the application.

(d) Individuals other than the attorney, agent or inventor may comply with this section by disclosing information to the attorney, agent, or inventor:

(e) In any continuation-in-part application, the duty under this section includes the duty to disclose to the Office all information known to the person to be material to patentability, as defined in paragraph (b) of this section, which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.